

78.(New) The method of analyzing the color of a diamond of Claim 74 wherein said step of illuminating the table-down diamond comprises illuminating with a daylight-approximating light.

79.(New) The method of analyzing the color of a diamond of Claim 74 further comprising the step of placing the diamond, table-down, on a platform.

80.(New) The method of analyzing the color of a diamond of Claim 74 further comprising the step of placing the diamond on an enclosed platform.

REMARKS

Applicant respectfully requests that the Examiner reconsider this application in the light of the foregoing amendments and the following remarks.

I. The New Claims

New Claims 54-80 are fully supported by the specification and drawings of this application and the priority applications. No new matter is added. The following remarks identify the portions of the specification and drawings that provide written and enabling support for the subject matter of the new claims. These remarks are presented to assist the Examiner in determining that new Claims 54-80 meet the requirements of 35 USC 112.

Claims 54, 60, 66, and 70: See, page 5, lines 16-20; page 20, lines 22-30; and Figs. 3, 5, and 7-9.

Claims 55, 61, 69, and 73: See, page 17, line 30, to page 18, line 1; and Fig. 7.

Claims 56, 57, 62, 63, 68, and 72: See, page 17, lines 5 to 21.

Claims 58 and 64: See, page 7, lines 5 to 21; and page 22, lines 4 to 7.

Claims 59 and 65: See, page 7, lines 5 to 21; page 21, lines 27 to 30; and page 22, lines 4 to 7.

Claims 67 and 71: See, page 24, line 18, to page 28, line 25.

Claim 74: See, page 17, lines 5 to 6; page 21, lines 15 to 26; page 17, line 30, to page 18, line 1; Fig. 7; page 21, lines 21 to 26; and page 26, lines 21 to 28.

Claim 75: See, page 17, line 30, to page 18, line 1; and Fig. 7.

Claims 76 and 77: See, page 21, line 27, to page 22, line 7.

Claims 78 and 79: See, page 17, lines 5 to 6.

Claim 80: See, page 17, lines 5 to 6; and Fig. 3 (platform 53 is “enclosed” in enclosure 2).

The Applicant believes that each of the new claims is directed to subject matter that is novel and nonobvious relative to the references of record in this application.

II. The Office Action

Applicant respectfully requests that the Examiner reconsider the rejection of the claims of the present application in view of the foregoing amendments and the following remarks.

A. The Drawings

The Examiner objected to the drawings because he concluded that they fail to show “structural detail that is essential for a proper understanding of the disclosed invention . . .” More specifically, the Examiner pointed out that the reference numerals “35a-d” as described at page 13, lines 4 and 11 of the specification are not shown in the drawing figures. The Examiner required a proposed correction to the drawings or a corrected drawing.

Applicant believes that the support legs for the imaging apparatus described at page 13 of the specification are not essential structural features. Indeed, they are not mentioned in any of the claims of the present application. Nevertheless, in order to expedite the allowance of this application, Applicant is submitting a proposed correction of Figures 2 and 3 of the drawings. Applicant is also amending the specification at page 13, lines 4 and 11 to conform to the corrected drawings by changing the reference term "35a-d" to "35". The changes to the drawings and the amendment of the specification do not add any new matter and are believed to overcome the Examiner's objection to the drawings.

B. 35 USC 103(a): Claims 42-46 and 50

The Examiner rejected Claims 42-46 and 50 under 35 USC 103(a) as being unpatentable over US Patent No. 5,615,005 (Valente) in view of US Patent No. 4,900,147 (Bowley). In making the rejection the Examiner reasoned that Valente describes all but one of the features of the Applicant's claimed system as set forth in Claim 42, that Bowley describes the missing feature, and that therefore, it would have been obvious to a person of ordinary skill in the art to combine the subject matter of Bowley with that of Valente.

Claim 42(Amended) is directed to a system for generating, maintaining, and retrieving characterizing information about gemstones. As set forth in Claim 42(Amended) the Applicant's claimed system includes a first illumination source disposed for illuminating a gemstone from a first aspect thereof, a second illumination source disposed for illuminating the gemstone from a second aspect thereof, and an electronic camera for viewing the gemstone and for generating first and second electronic signals. The first electronic signal corresponds to a first physical characteristic of the gemstone and is generated when the gemstone is illuminated by the

first illuminating source. The second electronic signal corresponds to a second physical characteristic of the gemstone and is generated when the gemstone is illuminated by the second illuminating source. Thus, at least two different physical characteristics of the gemstone are determined.

The Applicant's claimed system further includes electronic data processor means, data storage means, and comparing means. The data processor means is operatively connected to the electronic camera for receiving the first and second electronic signals. The data processor means controls the operation of the electronic camera and analyzes the electronic signals to provide data files that contain information identifying first and second physical characteristics of the gemstone. The data storage means is operatively connected to the data processor means. It is configured to store the identifying information data files for a plurality of gemstones. The comparing means reads the data file containing the identifying information of a viewed gemstone and the data files containing the identifying information of a plurality of known gemstones and compares the identifying information of the viewed gemstone to that of the known gemstones so that the viewed gemstone can be accurately identified. The means and methods by which the foregoing functions are performed are described at page 20, line 14, to page 28, line 25 of the present application.

Neither Valente nor Bowley describe or suggest the use of two different sources of illumination for illuminating a gemstone from two different aspects thereof. Valente uses a single light source to illuminate the gemstone. The light source is moved along a single fixed axis relative to the gemstone. Therefore, the gemstone is always illuminated from a single aspect. Bowley uses a single source of laser radiation. Although Bowley suggests that the gemstone can be moved to different orientations, it is always illuminated from the single source. Moreover, contrary to the Examiner's

assertion, the video camera used in the Bowley apparatus does not view the gemstone. Rather it is positioned to receive Raman radiation that has been scattered by the gemstone. See, Bowley at column 4, lines 27-40; and Figure 5.

Although Bowley suggests that the intensity of the scattered radiation of the diamond can be compared with records of known diamonds, the description of how that comparison is accomplished does not support the Examiner's interpretation of the reference. For example, at column 2, lines 45-51, Bowley states:

The record may be a point-by-point record of the Raman intensities or may be a record of the Raman intensities from the whole of the diamond simultaneously. Thus in the former case the record may be in the form of values stored on magnetic tape or in a computer etc. and in the latter case the record may be in the form of a photograph.

At column 3, lines 3-6, Bowley states:

A record of the diamond may be made in the form of stored Raman intensities which may be stored by conventional means, for example in a computer or on magnetic tape etc.

Further, at column 3, lines 19-22, Bowley states:

The record of the diamond may take the form of several such photographic images at different orientations of the diamond and may be used for future identification purposes.

In essence, Bowley describes the collection and recording of intensities of scattered Raman radiation either as a plurality of numerical values or in photographic form. Bowley neither describes nor suggests obtaining images of a gemstone viewed from different perspectives and illuminated by different light sources. Nor does it describe or suggest the use of those images to identify more than one physical characteristic of the gemstone.

The Applicant has found that the accuracy and reliability of uniquely identifying a gemstone can be significantly improved by using more than one physical characteristic. The known gem identification systems such as those described in Valente and in Bowley, have sought to uniquely identify gemstones on the basis of a single characteristic. Thus, even if the system described in Bowley could somehow be combined with the system described in Valente, the resulting system would not be the same as the Applicant's claimed system as set forth in Claim 42. Accordingly, the Examiner's proposed combination of Valente and Bowley fails to raise a *prima facie* case of unpatentability relative to the Applicant's claimed system as set forth in Claim 42.

Claims 43-46 and 50 depend from Claim 42 either directly or indirectly and therefore, are allowable over Valente and Bowley for at least the same reasons discussed above relative to Claim 42. Nevertheless, Applicant notes the following additional reasons why Claims 43-46 and 50 are allowable over Valente and Bowley.

Applicant's claimed system as set forth in Claim 43 is directed to a system as set forth in Claim 42 which includes light control means for controlling the first and second illumination sources so that the gemstone can be illuminated with one or both of the illumination sources. As noted above, Valente describes a system having only a single source of illumination. Therefore, Valente neither describes nor suggests a light control means as set forth in Claim 43. Bowley does not make up that deficiency.

Applicant's claimed system as set forth in Claim 44 is directed to the system of Claim 42 which includes means for displacing the gemstone relative to the electronic camera. In the system set forth in Claim 44, the electronic data processor includes means for controlling the electronic camera and the displacing means for capturing a

profile image and a color image of the gemstone. The Examiner's assertion that Bowley describes means for capturing a profile image with an electronic camera is incorrect. As discussed above, the camera (10) of the Bowley system does not "view" the diamond (1). Instead, it is positioned to receive the Raman radiation that is scattered by internal defects in the crystal structure of the diamond and reflected by the beam splitter (7). Consequently, the camera (10) does not and cannot obtain a "profile image" of the diamond. Furthermore, the text relied on by the Examiner describes the use of a photomultiplier or a multichannel detector for scanning the scattered Raman radiation. It does not describe the use of an electronic camera for capturing a profile image of the diamond. Therefore, the combination of Bowley with Valente, even if somehow possible, would not result in all of the features of the Applicant's claimed system as set forth in Claim 44.

Claim 46 is directed to the system set forth in Claim 43 which further includes means for capturing a fluorescence image of the gemstone with the electronic camera means. The Examiner cites Valente as suggesting that fluorescence of a diamond should be measured. However, the text from Valente relied on by the Examiner does not describe any method or apparatus for accomplishing that objective. The cited text reads as follows: "Additionally, the Hohberg system utilizes a "Flash Lamp" which does not provide a continuous light which the inventors consider should be used to measure the phosphorescence and fluorescence of gemstones." That statement alone is hardly a disclosure that would enable a person skilled in the art to make and use a means for capturing a fluorescence image of a gemstone, much less the means described and claimed in the present application.

For all of the foregoing reasons it is believed that the rejection of Claims 42-46 and 50 should be withdrawn because it is not based on substantial evidence.

C. 35 USC 103(a): Claims 47-49 and 51-53

The Examiner rejected Claims 47-49 and 51-53 under 35 USC 103(a) as being unpatentable over Valente and Bowley as applied to Claims 42 and 43, and further in view of US Patent No. 5,966,673 (Shannon). In making the rejection the Examiner stated:

Claim 47 is rejected because:

- A. Valente and Bowley teach all the claim limitations as disclosed above, except for the teaching of capturing brilliance and scintillation image of the gemstone with an electronic camera means.
- B. Shannon Sr. (Shannon hereinafter) discloses measuring/capturing scintillation of a gemstone (see col. 10, lines 27-30) with a camera means.
- C. In view of Shannon's teachings, it would have been obvious to one of ordinary skills in the art at the time the invention was made to incorporate Shannon's teaching of measuring/capturing scintillation of a gemstone, into Valente's and Bowley's system, due to the fact that such a combined system would provide an automated gemstone grading and data management system for use in appraising the value of a gemstone and to uniquely identify it. Accordingly, such incorporation would have constituted an alternative means/obvious engineering expedience for one of ordinary skill in the art at the time the invention was made. (Emphasis in original.)

Applicant's claimed system as set forth in Claim 47 is directed to a system as set forth in Claim 43 which includes means for displacing the gemstone relative to the electronic camera means and in which the electronic data processor means comprises means for controlling the electronic camera means and the displacing means for capturing a brilliance and scintillation image of the gemstone with the electronic camera means. Although it is true that Shannon describes measuring brilliance and scintillation of light that passes through a gemstone, Shannon requires complex mathematical models for illumination, cameras, and the gemstone in order to accomplish such measurements. See, Shannon at column 14, line 54, to column 16, line 52 (Illumination model); column 12, line 57, to column 14, line 53 (Camera model); and column 10, line 59, to column 12, line 12 (Gemstone model).

In contrast, the Applicant's claimed system captures images of the gemstone under at least two different lighting conditions using an electronic camera. The light information captured in the images is then analyzed to extract information on color, brilliance, scintillation, and other physical characteristics of the gemstone. The means and methods by which these functions are performed are described at page 20, line 14, to page 28, line 25, of the present application. It should be readily apparent from those portions of the specification that the means and methods set forth in Claim 47 are very different from the methods described in Shannon.

Moreover, the techniques described in Valente, Bowley, and Shannon are so different that it is not readily apparent how the Examiner's proposed combination could be accomplished. The Examiner has not provided any explanation of how the techniques described in of Valente, Bowley and Shannon could be readily combined. Indeed, the Examiner appears to have selected various features from the several references and combined them based only on the Applicant's claims and disclosure. Such hindsight analysis is not proper for establishing *prima facie* obviousness. It is well settled law that the suggestion or motivation to combine features from disparate references must come from the references themselves, not from the Applicant's specification or claims.

For all of the foregoing reasons it is believed that the Examiner's proposed combination of Valente, Bowley, and Shannon is improper and fails to make out a *prima facie* case of unpatentability under Section 103(a). Accordingly, the rejection is not based on substantial evidence and should be withdrawn.

Claims 48-49 and 51-53 depend from Claim 47 either directly or indirectly. Therefore, those claims are allowable for at least the same reasons as Claim 47.

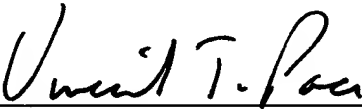
Application No. 09/701,195
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Examiner ROY M. PUNNOOSE
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CONCLUSION

In view of the foregoing amendments and remarks, it is believed that this application is in condition for allowance. It is respectfully requested that the Examiner reconsider the rejections set forth in the Official Action

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